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Indian Standard
SPECIFICATION FOR
ASYMMETRIC BARS

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR ASYMMETRIC BARS

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(*Continued on page 2*)

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Indian Standard

SPECIFICATION FOR ASYMMETRIC BARS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 29 November 1967, after the draft finalized by the Sports Goods Sectional Committee had been approved by the Consumer Products Division Council.

0.2 Asymmetric bars are essential equipment in gymnastic events. As the performance of the gymnast is dependent to a large extent on the equipment he uses and the equipment that is made available in competitions, formulation of a national standard was considered very essential.

0.3 This standard, dealing with the asymmetric bars, is one of a series of Indian Standards on sports goods, prepared on the recommendations of the Sports Goods Export Promotion Council, New Delhi.

0.4 ISO/TC 83 Gymnastics and Sports Equipment Technical Committee of the International Organization for Standardization (ISO), with the active help and collaboration of the International Gymnastic Federation (IGF) is concerning itself with standardization of equipment used in the international competitions. This standard is based on the ISO proposal on the subject.

0.5 Clauses 7.1 and 8.1 call for agreement between the purchaser and the supplier and permit the purchaser to use his option for selection to suit his requirements.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the requirements of asymmetric bars, used in physical culture and national and international gymnastic competitions.

*Rules for rounding off numerical values (revised).

2. MATERIAL

2.1 Bars — The bars may be made either of straight-grained well-seasoned wood or wood with a reinforcing core (for example, steel) to prevent breakage. The timber shall be free from knots, cracks, open splits, decay and stains, and the moisture content shall not exceed 14 percent. The recommended species of timber are:

TRADE NAME	BOTANICAL NAME
axlewood	<i>Anogeissus latifolia</i> Wall.
babul	<i>Acacia arabica</i> Willd.
benteak	<i>Lagerstroemia lanceolata</i> Wall.
bijasal	<i>Pterocarpus marsupium</i> Roxb.
dhaman	<i>Grewia tiliaefolia</i> Vahl.
laurel	<i>Terminalia tomentosa</i> Wight et Arn.
sal	<i>Shorea robusta</i> Gaertn. f.
sandan	<i>Ougeinia ojeinensis</i> (Roxb.) Hochreut

2.2 Framework — It is left to the discretion of the manufacturer but it shall be capable of withstanding the tests specified in 5.1 to 5.3.

3. SHAPE AND DIMENSIONS

3.1 Typical shape of the asymmetric bars is given in Fig. 1. The dimensions shall conform to those specified in the figure.

4. MANUFACTURE

4.1 Only the shape and dimensions required to assure the performance of the equipment have been covered in this standard. Where dimensions are not specified, they are left to the discretion of the manufacturer.

4.2 The height and side adjustment device of the bars shall be so constructed that its efficiency shall not diminish during use.

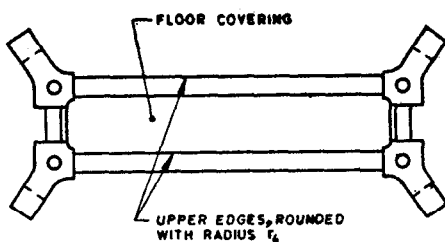
4.3 It is left to the discretion of the manufacturer to manufacture the longer uprights without bracing.

4.4 The joint screws shall be so fixed that these shall not work loose. Screw heads and joint screws shall not project so as to avoid any possibility of injury by contact with them.

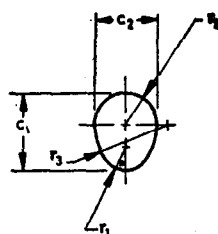
4.5 The floor covering shall remain immovable after being placed in position.

5. TESTS

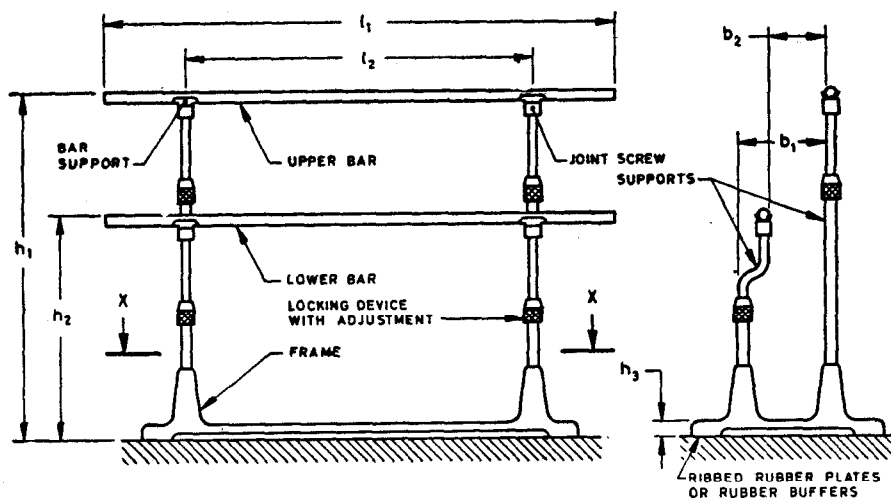
5.1 Stability — This shall be verified by subjecting the asymmetric bars to test as detailed in Appendix A.



SECTION XX



PROFILE OF BAR



b_1	480 to 520
b_2^*	430
c_1	51^{+0}_{-1}
c_2	41^{+0}_{-1}
h_1	2 300
h_2	1 500

h_3	100, Max
l_1	$3\ 500 \times 10$
l_2	$2\ 300 \times 3$
r_1	17.5
r_2	20.5
r_3	48
r_4	10

*The width between the bars obtained by the side adjustment to the interior shall be 430 mm, Max.

All dimensions in millimetres.

FIG. 1 ASYMMETRIC BARS, TYPICAL

5.2 Lateral Deflection of Columns — This shall be verified by subjecting the asymmetric bars to test as detailed in Appendix B.

5.3 Elasticity of Bars — This shall be verified by subjecting the asymmetric bars to test as detailed in Appendix C.

6. MARKING

6.1 Each piece of asymmetric bars shall carry the manufacturer's name, identification mark or registered trade-mark.

6.1.1 The asymmetric bars may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

7. PACKING

7.1 The asymmetric bars shall be packed as agreed to between the purchaser and the supplier.

8. SAMPLING

8.1 Sampling and acceptance criteria for asymmetric bars shall be as agreed to between the purchaser and the supplier. A recommended scheme for the same is given in Appendix D.

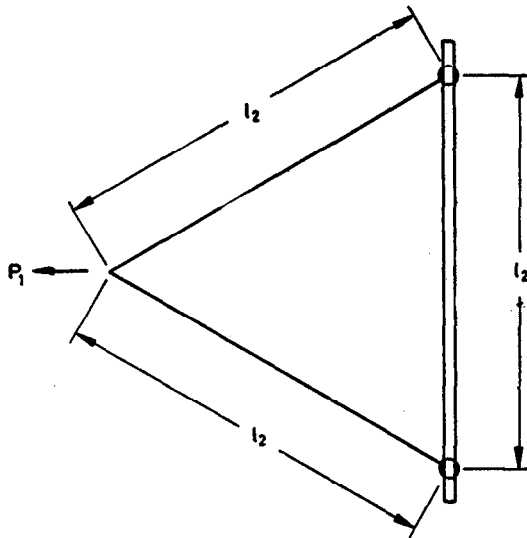
APPENDIX A

(Clause 5.1)

STABILITY OF ASYMMETRIC BARS

A-1. PROCEDURE

A-1.1 A force P_1 equivalent to 120 kgf, acting laterally outwards shall be applied at a level of h_1 (see Fig. 2). This shall not be capable of lifting the asymmetric bars off the floor; the side of the frame being opposite to centre of overturning. The force P_1 shall act at the end of two ropes of l_2 length fixed directly below the uprights. Asymmetric bars which fail to satisfy the stability test shall be fixed on the floor.



VIEW IN DIRECTION X

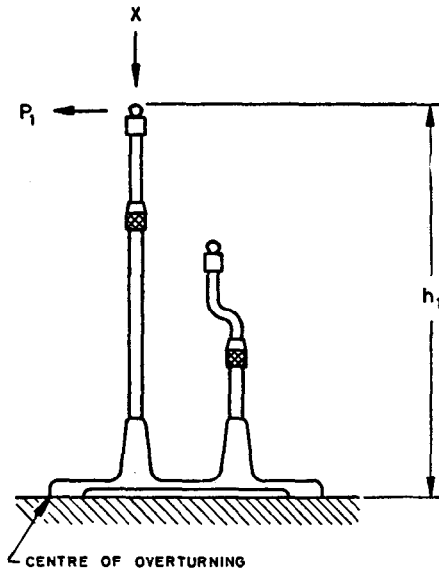


FIG. 2 STABILITY TEST ARRANGEMENT

APPENDIX B

(Clause 5.2)

LATERAL DEFLECTION OF COLUMNS

B-1. PROCEDURE

B-1.1 A force P_2 equivalent to 60 kgf, acting laterally outwards at the upright, shall be applied at a level of h_1 (see Fig. 3). The lateral deflection of single upright shall not exceed f_2 equal to 16 mm.

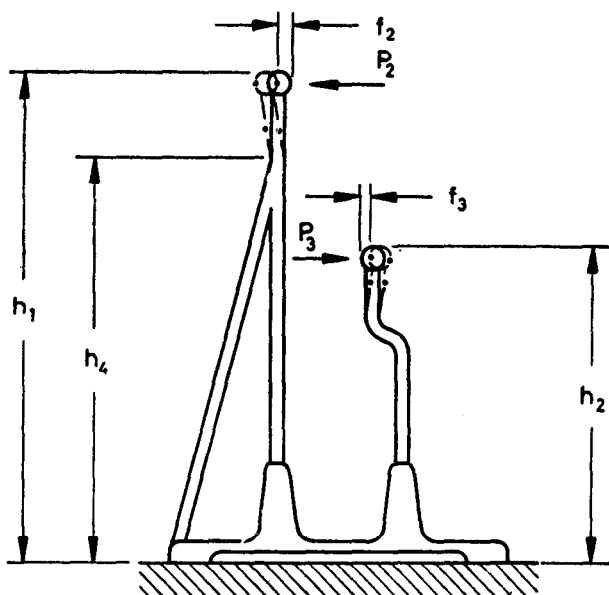


FIG. 3 LATERAL DEFLECTION TEST ARRANGEMENT

B-1.2 Similarly, a force P_3 equivalent to 60 kgf, acting laterally outwards at the upright shall be applied at a level of h_2 . The lateral deflection of the single upright shall not exceed f_3 equal to 8 mm.

NOTE — It is left to the discretion of the manufacturer to provide lateral bracings from the frame to the longer uprights. In case these are provided, these shall not be higher than h_4 equal to 1 900 mm going from floor to the uprights.

APPENDIX C

(Clause 5.3)

ELASTICITY OF BARS

C-1. PROCEDURE

C-1.1 A force P_4 equivalent to 135 kgf shall be applied on the centre of each bar at a level of h_1 and h_2 respectively (see Fig. 4). The deflection of the bar shall amount to f_4 equal to 60 ± 6 mm. Also, the bar shall return to its straight position after removal of the load.

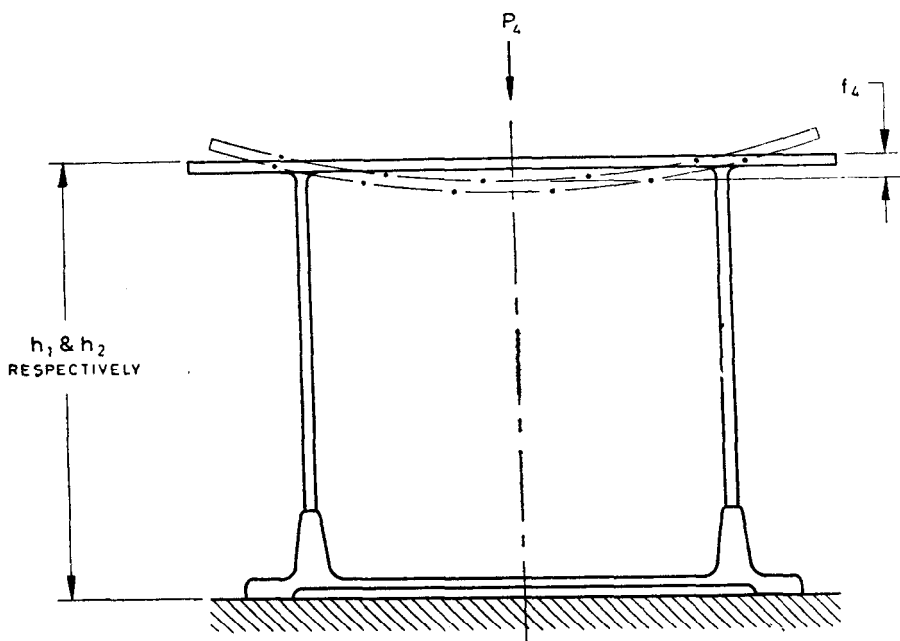


FIG. 4 ELASTICITY TEST ARRANGEMENT

APPENDIX D

(Clause 8.1)

**RECOMMENDED SAMPLING SCHEME AND CRITERIA
FOR CONFORMITY FOR ASYMMETRIC BARS****D-1. LOT**

D-1.1 In any consignment all the asymmetric bars of the same material shall be grouped together to constitute the lot.

D-1.1.1 Each lot shall be inspected separately for ascertaining its conformity or otherwise to the requirements of this specification.

D-2. SELECTION OF SAMPLES

D-2.1 The number of bars to be selected at random for the sample depending upon the size of the lot shall be in accordance with col 1 and 2 of Table 1.

TABLE 1 SAMPLE SIZE AND CRITERIA FOR CONFORMITY

NUMBER OF BARS IN THE LOT	NUMBER OF BARS TO BE SELECTED IN THE SAMPLE	PERMISSIBLE NUMBER OF DEFECTIVE BARS
(1)	(2)	(3)
Up to 5	All	0
6 „ 25	5	0
26 „ 50	8	0
51 „ 100	13	0
101 „ 150	20	1
151 and above	32	2

D-2.2 The bars in the sample shall be selected at random from the lot and in order to ensure the randomness of selection, random number tables shall be used. In case random number tables are not available, the procedure given in **D-2.2.1** may be adopted.

D-2.2.1 Starting from any piece in the lot count them as 1, 2, 3, ..., up to r and so on in one order, where r is the integral part of N/n (N being the lot size and n being the number of bars to be selected). Every r th piece thus counted shall be withdrawn to give sample for inspection and testing.

D-3. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

D-3.1 Each piece in the sample shall be inspected for material, shape and dimensions, manufacture, and tested for stability (*see* Appendix A), lateral deflection of columns (*see* Appendix B), and elasticity of bars (*see* Appendix C). Each piece failing to meet any one or more of the requirements of this specification shall be considered as defective.

D-3.2 The lot shall be declared as conforming to the requirements of this specification if the number of defective bars in the sample as obtained in **D-3.1** does not exceed the permissible number of defectives given in col 3 of Table 1.

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